

DN A01475 US

PATENT

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A precision fragmentation assemblage wherein said assemblage comprises:

(A) a plurality of fragmentation domains; and

(B) one or more fragmentation zones;

wherein said fragmentation domain comprises at least one first polymer; and

wherein said fragmentation zone comprises:

- (i) one or more connecting phases;
- (ii) optionally, one or more pore phases; and
- (ii) optionally plural polymeric nanoparticles; and

wherein:

said connecting phase comprises at least one second polymer;

said second polymer comprises at least one multi-ethylenically

unsaturated monomer, present as polymerized units, in an amount

of at least 0.05 percent by weight to 100 percent by weight, based

on the weight of said second polymer; and

wherein said nanoparticles comprise at least one third polymer.

Claim 2 (currently amended): A precision fragmentation assemblage catalyst, wherein said catalyst comprises:

(A) a precision fragmentation assemblage; and

(B) at least one catalytic component;

wherein said precision fragmentation assemblage comprises:

- (i) a plurality of fragmentation domains; and

BEST AVAILABLE COPY

DN A01475 US

PATENT

(ii) one or more fragmentation zones;

wherein said fragmentation domain comprises at least one first polymer; and
wherein said fragmentation zone comprises at least one connecting phase, said
connecting phase comprising at least one second polymer, said second
polymer comprising at least one multi-ethylenically unsaturated second
monomer, present as polymerized units, in an amount from 0.05 percent
by weight to 100 percent by weight, based on the weight of the second
polymer.

Claim 3 (original): The catalyst of claim 2, wherein said catalyst further comprises at least one activator component.

Claim 4 (original): The catalyst of claim 2, wherein said fragmentation zone further comprises at least one pore phase.

Claim 5 (original): The catalyst of claim 2, wherein said fragmentation zone further comprises plural polymeric nanoparticles comprising at least one third polymer.

Claim 6 (original): The catalyst of claim 2, further comprising one or more tether groups covalently bound to a polymeric chain, wherein said polymeric chain is a chain selected from the group consisting of said first polymer, said second polymer, and combinations thereof.

Claim 7 (original): The catalyst of claim 5, further comprising one or more tether groups covalently bound to a polymeric chain, wherein said polymeric chain is a chain selected from the group consisting of said first polymer, said second polymer, said third polymer, and combinations thereof.

Claim 8 (original): The catalyst of claim 2, wherein said catalytic component is an organometallic catalyst based on a metal, wherein said metal is a metal selected

DN A01475 US

PATENT

from the group consisting of metals of Group 3-11, lanthanide metals, actinide metals, and combinations thereof.

Claim 9 (original): The catalyst composition of claim 3, wherein said activator component is an activator component selected from the group consisting of organoaluminum compounds, organoaluminoxane compounds, hydroxyaluminoxanes, aluminoxinates, organic borane compounds, inorganic borane compounds, borate anions, and mixtures thereof.

Claim 10 (currently amended): An olefin polymerization process, wherein said olefin polymerization process comprises:

- (A) contacting at least one olefin monomer with at least one precision fragmentation assemblage catalyst;
- (B) polymerizing said olefin monomer to produce a polyolefin;
- (C) isolating said polyolefin,

wherein said catalyst comprises:

- (i) a ~~prefragmentation~~ precision fragmentation assemblage; and
- (ii) at least one catalytic component;

wherein said ~~prefragmentation~~ precision fragmentation assemblage comprises:

- (a) a plurality of fragmentation domains; and
- (b) one or more fragmentation zones;

wherein said fragmentation domain comprises at least one first polymer; and

wherein said fragmentation zone comprises at least one connecting phase, said connecting phase comprising at least one second polymer, said second polymer comprising at least one multi-ethylenically unsaturated monomer, present as polymerized units, in an amount of at least 0.05 percent by weight to 100 percent by weight, based on the weight of said second polymer.

DN A01475 US

PATENT

Claim 11 (new): The precision fragmentation assemblage of claim 1, further comprising one or more tether groups covalently bound to a polymeric chain, wherein said polymeric chain is a chain selected from the group consisting of said first polymer, said second polymer, said third polymer, and combinations thereof.

Claim 12 (new): The precision fragmentation assemblage of claim 11, wherein said tether group comprises a functional group selected from the group consisting of epoxy, vinyl, allyl, primary amino, secondary amino, imino, amide, imide, aziridinyl, hydrazide, amidino, hydroxy, hydroperoxy, carboxyl, formyl, methoxycarbonyl, carbamoyl, sulfone, sulfine, sulfeno, thiol, thiocarboxyl, thioformyl, pyrrolyl, imidazolyl, piperidyl, indazolyl, carbazolyl, and combinations thereof.

Claim 13 (new): The precision fragmentation assemblage of claim 1, wherein said fragmentation domain has an average particle size of at least 0.002 microns to no more than 20 microns.

Claim 14 (new): The precision fragmentation assemblage of claim 1, wherein said polymeric nanoparticle has an average particle size of at least 0.002 microns to no more than 0.1 microns.

Claim 15 (new): The precision fragmentation assemblage of claim 1, wherein said first polymer comprises at least one multi-ethylenically unsaturated monomer, present as polymerized units, in an amount of at least 0.5 percent by weight to 100 percent by weight, based on the weight of said first polymer.

Claim 16 (new): The precision fragmentation assemblage of claim 1, wherein said third polymer comprises at least one multi-ethylenically unsaturated monomer, present as polymerized units, in an amount of at least 2 percent by weight to 100 percent by weight, based on the weight of said third polymer.

DN A01475 US

PATENT

Claim 17 (new): The precision fragmentation assemblage of claim 1, wherein said precision fragmentation assemblage has an average particle size of at least 1 micron and no more than 1000 microns.

Claim 18 (new): The catalyst of claim 6, wherein said tether group comprises a functional group selected from the group consisting of epoxy, vinyl, allyl, primary amino, secondary amino, imino, amide, imide, aziridinyl, hydrazide, amidino, hydroxy, hydroperoxy, carboxyl, formyl, methoxycarbonyl, carbamoyl, sulfone, sulfine, sulfeno, thiol, thiocarboxyl, thioformyl, pyrrolyl, imidazolyl, piperidyl, indazolyl, carbazolyl, and combinations thereof.

Claim 19 (new): The catalyst of claim 7, wherein said tether group comprises a functional group selected from the group consisting of epoxy, vinyl, allyl, primary amino, secondary amino, imino, amide, imide, aziridinyl, hydrazide, amidino, hydroxy, hydroperoxy, carboxyl, formyl, methoxycarbonyl, carbamoyl, sulfone, sulfine, sulfeno, thiol, thiocarboxyl, thioformyl, pyrrolyl, imidazolyl, piperidyl, indazolyl, carbazolyl, and combinations thereof.

Claim 20 (new): The catalyst of claim 2, wherein said fragmentation domain has an average particle size of at least 0.002 microns to no more than 20 microns.